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EXAMINER

THOMAS, SHANE M

ART UNIT PAPER NUMBER

2186

DATE MAILED: 05/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/872,243

Applicant(s)

NGAI ET AL.

Examiner

Shane M. Thomas

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-8, 10-27 and 54-102 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 27 is/are allowed.
- 6) ☒ Claim(s) 2-7, 10-16, 19, 25, 26, 54-57, 59-71, 73-79, 82, 88, 89, 91-94 and 96-102 is/are rejected.
- 7) ☒ Claim(s) 8, 17, 18, 20-24, 58, 72, 80, 81, 83-87, 90 and 95 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office action is responsive to the amendment filed 3/7/2005. Claims 2-8, 10-27, and 54-102 have been amended and are presented for examination.

All previous outstanding objections and rejections to the Applicant's disclosure and claims not contained in this Action have been respectfully withdrawn by the Examiner hereto.

#### ***Claim Objections***

Claims 66-102 are objected to because of the following informalities: the Examiner recommends amending the preamble of claims 66-102 in order to modify --A computer-readable medium-- to --A tangible computer-readable medium--. Such a modification would distinguish between [tangible] statutory subject matter (i.e. the nonvolatile and volatile media mentioned on page 52 of the Applicant's disclosure) and the non-statutory subject matter (i.e. the carrier waves - acoustic/light waves, radio-wave, infrared waves) mentioned on page 52 of the Applicant's disclosure).

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 2,4-7,10-16,25,26,54-57,59-66,68-71,73-79,88,89,91-94, and 96-102 are rejected under 35 U.S.C. 102(e) as being anticipated by Ganesh et al. (U.S. Patent No. 6,295,610).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

In order to make this Office action more coherent, the Examiner will follow the order of claim dependence of the independent claims instead of chronological claim order. Therefore, the rejection of claims 12 and 13 will follow the rejection of claim 2 since they are the next claims dependent upon on claim 2. Likewise, the rejection of claim 10 will follow the rejection of claim 54, since claim 10 is dependent upon claim 54.

As per claims 2 and 66, Ganesh shows in figure 3A a storage space 300 that stores undo information 312-334 that, when applied, returns the data to which changes were made by a

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transaction to a state if the data that existed prior to the initiation of the transaction (column 7, lines 31-37). The undo information for each entity (transaction) of the plurality of entities (transactions) is stored in a segment (transaction table slot in combination with the undo chain (linked list of undo blocks). For example, referring to figure 3A, the transaction in slot 0 of the transaction table 310 stores undo information in the segment comprising undo blocks 312, 314, and 316.

Usage of the transaction table along with the storage space (undo blocks - both used and unused) by the entities (transactions) is monitored such that when a new entity is to begin to execute and makes changes to the database, the new transaction is assigned a segment (slot of transaction table and undo records as necessary - refer to figures 3A and 3B) in which to store the undo information of the transaction. The assignment of a transaction (entity) with a transaction slot is based on the usage of the allocation of slots of the transaction table 310. If the transaction table is full, the entry slot containing the oldest transaction is overwritten with the new entry (column 7, lines 47-54).

Both the number of segments (up to the threshold of the transaction table) and the sizes of the segments (undo blocks - figure 3A, elements 312-334) can be increased. Increasing the size of the segments is an inherent feature of the database undo system of Ganesh. While Ganesh does not explicitly teach expanding the segment size, Ganesh shows in figure 3A a block count 344 and discuss the block count in column 7, lines 15-23. Thus it can be seen that as the undo records of an undo block are filled, another [empty] undo block can be allocated to the entity's segment and then linked to the previous undo block as shown in figure 3A. The block count

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column 344 of the transaction details the number of undo blocks comprising the respective segment.

Further regarding claim 66, Ganesh anticipates a computer readable medium carrying instructions that when executed perform the functions of the present invention. Refer to claims 10-18 of Ganesh and column 5, line 37 - column 6, line 22, Thus, claim 66 is anticipated by Ganesh.

As per claim 12, when the transaction table 310 is not yet full with either committed or active transactions, an inherent determination is made for the next available transaction table slot for an entry to occupy. For example, if slots 0-2 are currently being used by entities, it can be seen that it would have been determined if segment slot 3 was available (i.e. not being used by another entity) and if not, the segment slot 3 would be allocated to the new transaction (entity) for storing undo information for the entity. Undo information is stored in the segment as discussed above with respect to the rejection of claim 2 and column 7, lines 1-62.

As per claim 13, Ganesh teaches in column 7, lines 47-54, that a determination based on whether a first amount of storage space (entry in the transaction table 310), allocated to a first segment (oldest transaction), is not being used by the executing transactions (plurality of entries). Once found, the oldest transaction slot (first amount) is associated with a new entity (new transaction) and in order to distinguish between the old and new transaction, the sequence number 338 is updated.

As per claim 4, the rejection for lines 1-11 follows the rejection for claim 2. Regarding lines 12-15, the Examiner is considering --each period of time-- to be when a new transaction is to begin execution and thus a transaction slot (portion of a segment) is required. Thus a --series

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of periods of time-- is being considered to be the plurality of instances when a new transactions start. The transaction table 310 is automatically adjusted each time a new transaction starts until the transaction table becomes full. In other words, for the first N transactions, one of the N entries in the transaction table 310 is allocated for the respective transactions. The Examiner is considering a --first period of time-- to be when the number of transactions slots occupied in the transaction table is less than N, and a --second period of time-- to be when the transaction table is full. When the transaction table is full and a new transaction is slated to begin execution, the oldest transaction is replaced (column 7, lines 47-54), thus the automatically adjusting does not occur during the second period of time in comparison with the first period of time (where the table is adjusted to include a new entry for the new transaction).

As per claim 5, Ganesh teaches in column 7, lines 47-54, that if the transaction table is full, a new transaction will take the place of the oldest transaction. Thus it is inherent that the undo blocks (containing the undo records) of oldest transaction become de-allocated, as they would no longer be associated with an active transaction. Therefore, it can be seen that during the predetermined period of time [when a new transaction takes the place of the oldest transaction], since usage has decreased for the oldest transaction, the sum of the sizes of the plurality of segments (cumulative size of the undo block chains for all the transactions of the table 310) would inherently shrink since the undo block chain associated with the oldest transaction would be reset in order to make room for the newest transaction (entry).

As per claim 6, the oldest transaction is removed and therefore it can be seen that its associated segment (transaction table information/entry and associated undo blocks) is deleted.

As per claim 7, lines 1-6 follow the rejection of claim 5 while the rejection of lines 7-11 follows the rejection for claim 13, above.

As per claim 54, Ganesh teaches storing undo information for undo the changes made to a database in column 7, lines 1-62. The undo records, when applied to the database, returns the data in the database to the data that existed prior to the changes - column 7, lines 31-37. The storage area includes a plurality of rollback segments; figure 3A shows such a rollback segment 300. Ganesh teaches in column 7, lines 1-5, that a system can contain a plurality of segments. Because each segment utilizes a transaction table that overwrites its oldest transaction when the table becomes full with transactions (column 7, lines 47-54), it can be seen that the rollback segment 300 is a --circular buffer-- as its entries are constantly being reused when a new transaction begins

The Examiner is considering the --storage area-- to be all of the undo blocks 312-334 that are actively allocated to the transactions contained in the transaction tables 310 of each of the segments 300 of the system of Ganesh as well as all of the entries in the table 310. Referring to the argument in the rejection of claim 2, the block count indication 344 of the transaction table inherently shows automatically adjusting the size of the storage area by adding new undo blocks to the undo chains of transactions as more undo records are required based on the changes (usage) made to the database by a given transaction. Thus, the usage of the segments 300 (originating from the transaction contained within the segments) results in the adjusting (increasing) of size of the storage area, as defined above.

Interpreting the claim differently in light of the teachings of Ganesh, the rejection follows the rejection for claim 2 with each segment being a combination of a slot entry of the transaction



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table 310 of figure 3A as well as the associated undo blocks 312-334. Each segment can be considered to be used as a circular buffer since it buffers the incoming undo data and can be reused in a circular fashion (reused for a new transaction) when it is the oldest transaction in the transaction table 310. Thus all of the segments can be considered --circular buffers--.

As per claim 10, the Examiner is considering --first conditions-- to be if the transaction table 310 is *not* full and a --first amount of storage space-- to be the slot entry portion of a segment of transaction table 310. Thus, if the first conditions are satisfied (table not full), the next available slot entry (first amount of storage space) is allocated to a new segment of the plurality of segments. Refer to column 7, lines 47-54.

As per claim 11, the Examiner is considering --first conditions-- to be if the table is full. Thus, if the first conditions are met (table is full meaning that every slot portion of the plurality of segments corresponds to a transaction), Ganesh teaches in column 7, lines 47-54, that a new segment is formed to store undo info for a new entity (transaction) by overwriting the transaction table 310 entry of the oldest transaction with the new segment.

As per claim 14, as shown in figure 3A transactions (entities) are each associated with a respective segment (combination of transaction table entry and corresponding undo chain. When an entity (transaction) is running out of storage space (i.e. the latest undo block is filling with undo records - figure 3B), it is inherent in the system of Ganesh that another undo block be allocated to the transaction in response to the --request-- (indication that the current undo block is full). The inherency can be seen with regard to figure 3A and block count column 344, as when another undo block is allocated to a respective transaction, the block count increases. Refer to column 7, lines 15-23.

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As per claim 15, the rejection follows the rejection of claim 14, wherein an inherent determination is made when the transaction is writing undo data to the latest undo block of its undo chain portion of the segment. If sufficient storage is not already allocated to the first segment (i.e. another undo block is needed to store more undo records from the transaction), the size of the undo chain is increased (thereby increasing the size of the first segment) by adding an undo block. The inherency can be seen with regard to figure 3A and block count column 344, as when another undo block is allocated to a respective transaction, the block count increases. Refer to column 7, lines 15-23.

As per claim 16, the new undo block that is appended to the beginning of the undo chain of a transaction whose previous undo block has been filled with undo records is being considered by the Examiner to be --sufficient-- for storing undo information included in the request for another undo block from the requesting transaction.

As per claim 25, Ganesh teaches in column 1, lines 39-50, that all changes to a database system are recorded on a disk medium by a background process. Therefore, the Examiner is considering the additional amount of additional storage that was dynamically allocated to the undo chain of the first segment [of the requesting transaction] to be an extent of the contiguous storage space since the additional storage is disk memory and disk memory is known in the art to be physically contiguous.

As per claim 26, as is mentioned in column 7, lines 15-23, of Ganesh, unused undo blocks can be allocated to the undo chains portions of the transactions' segments in response to receiving undo information from the plurality of entities (transactions). Ganesh teaches in column 7, lines 47-54, that if the transaction table is full, a new transaction will take the place of

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the oldest transaction. Thus it is inherent that the undo blocks (containing the undo records) of oldest transaction become de-allocated, as they would no longer be associated with an active transaction. Therefore, it can be seen that periodically, when a new transaction takes the place of the oldest transaction, the de-allocation of unused amounts of storage space (from the oldest transaction) occurs.

As per claim 55, Ganesh gives a scenario in column 7, lines 47-57, where the number of transactions exceeds the limited memory of the transaction table 310. Thus it is inherent that during the point in time when the table is not full, that the automatically adjusting is performed by adding a segment (allocating another slot in the table 310) to the plurality of [valid] segments.

As per claim 56, Ganesh teaches in column 7, lines 15-12, that a block count is used to keep a running count of the number of undo blocks that are associated with a respective entry in the transaction table 310. Thus it is inherent that the system of Ganesh be able to allocate a free, unused undo block (312-334) and append it to an undo chain portion of the segment of a respective transaction that requires another undo block in which to store undo records. Refer to figure 3B.

As per claim 57, Ganesh teaches in column 7, lines 47-54, that when the transaction table 310 is full and an a new transaction requires an entry, the oldest transaction is overwritten. Thus, it can be seen that the [other] storage space that is being used by the segment of the oldest transaction is de-allocated.

As per claim 59, as taught in column 7, lines 47-54, the system of Ganesh allocates the storage space of the transaction slot of the oldest transaction in the transaction table to the new

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transaction. Thus the new transaction has been allocated the segment that was occupied by the oldest transaction.

As per claim 60, if the usage of the transaction table is at capacity (full) the system of Ganesh assigns a new entity (transaction) to the slot portion of the oldest segment (column 7, lines 47-54). Thus the new transaction is allocated the storage space in the transaction table 310 of the once oldest transaction.

As per claim 61, statistical information to determine the usage of the plurality of segments (entries of the transaction table 310 along with their corresponding undo chains) as taught in column 7, lines 56-62. Additionally, statistical information (such as age of the transaction in the transaction table 310) must be gathered in order to determine which transaction is the oldest when the step of column 7, lines 47-54, is executed. Another such statistical information is the block count 344 entry of the transaction table 310.

As per claim 62, statistical information such as the transaction IDs are stored in the data containers (figure 4). It is also inherent that the statistical information used for determining the oldest transaction be stored somewhere as well in order to be able to distinguish which transaction is the oldest. Regarding the block count statistical info, the info is shown in figure 3A as being stored as a column in the transaction table 310.

As per claim 63, the statistical info regarding the usage (i.e. the block count of the undo chain) is stored in an array, or column, 344 of the transaction table 310 of figure 3A.

As per claim 64, the statistical info regarding the usage (block count 344) is stored (i.e. updated) periodically whenever another undo block is added to the undo chain of a respective segment.

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As per claim 65, as shown in figure 3A, the transaction table 310 shows more than two segments. The usage (age and block count for example) is determined for the plurality of segments and when the transaction table is full, a determination is made based on the usage (age) of the plurality of segments. The slot portion of the oldest transaction in the transaction table is assigned to a new entity (transaction) based on the determination of the oldest transaction.

As per claims 68-71,73-79,88,89,91-94, and 96-102, their rejections follow the rejections of claims 4-7,10-16,25,26,54-57, and 59-65, respectively. The computer-readable medium limitation is anticipated by Ganesh as discussed in the rejection of claim 66, above.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh et al. (U.S. Patent No. 6,295,610) in view of Wahl (U.S. Patent No. 6,324,654).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of

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invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(l)(1) and § 706.02(l)(2).

As per claims 3 and 67, while Ganesh does not specifically teach establishing a maximum amount of storage space (collection of undo blocks), Wahl teaches in column 7, line 60 - column 8, line 2, that a maximum amount of storage space can be established in system to be used for recovery purposes (i.e. post-crash processing). Therefore, it would have been obvious to one having ordinary skill in the art to have combined the system of Ganesh with the teaching of Wahl in order to have prevent an overrun condition during the undo recording process of Ganesh.

Claims 3,19,67, and 82 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ganesh et al. (U.S. Patent No. 6,295,610).

Further regarding claims 3 and 67, while Ganesh does not specifically teach establishing a maximum amount of storage space (collection of undo blocks); however it would have been obvious to one having ordinary skill in the art at the time the invention was made to have determined that the storage space comprised of undo blocks - just as in the transaction table - is

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finite. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have established a maximum number of undo blocks and preventing the number of undo blocks, that comprises the size of the plurality of segments, from exceeding the maximum, as it is a physical limitation of the system of Ganesh.

As per claims 19 and 82, Ganesh teaches that undo blocks can be added to a transaction's segment in column 7, lines 15-23, but does not specifically state *determining* whether or not the additional amount of storage space (undo block) is available; however, it would have been obvious to one having ordinary skill in the art to have modified the system of Ganesh in order to have determined whether an additional free undo block is available in the storage space (all of the undo blocks). By determining whether an undo block is free, the system of Ganesh would not have overwritten an undo block that is currently being used by an active transaction (within that transaction's segment), thereby averting a data integrity issue.

#### ***Allowable Subject Matter***

Claims 27 is allowable over the prior art of record, as mentioned in the previous Office action, dated 2 February 2004. The prior art of record does not specifically teach nor suggest every limitation presented in claim 27.

Claims 8,17,18,20-24,58,72,80,81,83-87, and 95, are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

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As per claim 8, the prior art of record does not teach nor suggest determining whether de-allocating the first amount leaves an amount allocated to the first segment that is less than a predetermined minimum amount and if so, deletes the first segment.

As per claim 17, the prior art of record does not specifically nor suggest teach allocating an additional amount of storage space to the first segment wherein the amount of storage space is based on the storage already allocated to the first segment. Ganesh simply allocates another [same sized] undo block when a present block is full of undo records. Refer to column 7, lines 15-23.

As per claim 18, the prior art of record does not specifically nor suggest allocating an additional amount of storage space to the first segment wherein the amount of storage space is selected from a plurality of predetermined amounts.

As per claim 20, the prior art of record does not specifically teach nor suggest determining whether the additional amount is currently allocated to a second segment and if it is not being used then allocating it to the first segment. In relation to the Ganesh reference, Ganesh does not teach de-allocating a portion of the storage space (undo blocks) from one transaction to another since all of the undo blocks associated with a given transaction are being used by that transaction.

As per claim 21, the prior art of record does not specifically teach nor suggest monitoring usage in each period of time of an amount of the undo information stored in each period of time.

As per claim 22, the prior art of record does not specifically teach nor suggest monitoring a number of entities started in each period of time.



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As per claim 23, the prior art of record does not specifically teach nor suggest monitoring a maximum number of entities executing concurrently in each period of time.

As per claim 24, the prior art of record does not specifically teach nor suggest monitoring a maximum duration in each period of time among durations of queries termination during the period of time, wherein the queries use at least some of the undo information stored in the storage space.

As per claim 58, the prior art of record does not specifically teach nor suggest determining whether the storage space allocated to a transaction's segment is no longer being used by the segment and then de-allocating the portion of the storage space that is not being used by the segment.

Claims 72,80,81,83-87, and 95, are objected to as being dependent on objected to claims 8, 17, 18, 20-24, and 58, respectively.

### ***Response to Amendment***

As per Applicant's amendment filed 7 March 2005, the previous rejections have been withdrawn as per the change of scope of the claims. Claims 2-7,10-16,19,25,26,54-57,59-71,73-79,82,88,89,91-94 and 96-102 stand rejected. Claim 27 is allowable over the prior art of record. Claims 8,17,18,20-24,58,72,80,81,83-87,90, and 85 are objected to.

***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shane M. Thomas whose telephone number is (571) 272-4188. The examiner can normally be reached on M-F 8:30 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Shane M. Thomas



**HONG CHONG KIM**  
**PRIMARY EXAMINER**